

**KEB**



**C<sup>®</sup> RU<sup>®</sup> US**

## **HIGH TORQUE SERIES DL4**

SERVO SYSTEMS - WITH AIR AND LIQUID COOLING

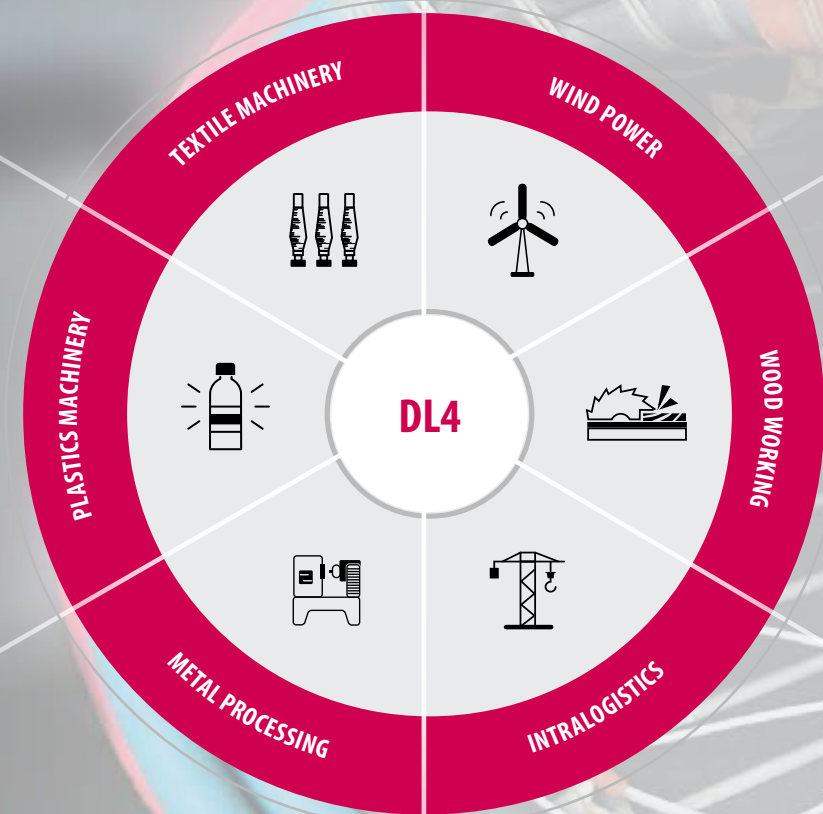
EN

- Spinning technology
- Weaving
- Knitting
- Finishing

- Pitch systems
- Yaw systems
- Auxiliary equipment

DL4 motors stand for the highest dynamics and maximum flexibility in the connection of the machine design. The use of rare earth permanent magnets ensures a high energy density – the design of the magnetic circuit for sinusoidal voltages combines low ripple torque with high overload without danger of demagnetization.

- Extrusion
- Injection molding
- Blow forming
- Foils
- Handling



- Saws
- Milling
- Drilling
- Portals
- Shredder

- Bending
- Cutting
- Grinding
- Lathes
- Milling
- Die casting
- Pressing
- Drilling

- Stacker cranes
- Tower cranes
- Lifts and escalators
- Transportation



CE  
cULus  
FS

**WATER COOLED VERSION DL4-LC**

The new water-cooled variant uses optimal thermal conditions and thus combines the properties of the highest power density, the best overload with high reserves. This results into about 25% higher torque compared to the forced ventilated versions.



**SERVO SYSTEMS**

In combination with the servo inverter series KEB COMBIVERT F6, as well as assembled encoder / motor cables, powerful Drive systems are created, that perfectly match optimal properties of speed and torque characteristics, as well as provide high efficiency and easy startup.

More details of the DRIVE CONTROLLER portfolio are described in the catalogue COMBIVERT F6.





**MOTOR STANDARDS**

Design	IM B5 according to CEI EN 60034-7 (1993)
Protection	IP 54 according to CEI EN 60034-5-(2001)
Shaft	with keyway balancing with half key CEI 2-23 (1993) special shaft (on request)
Encoder systems	Resolver Hiperface SRS50 - 16 bit Hiperface SRM50 - 16 bit /Multiturn - 12 bit without encoder (SCL-operation)
Thermal design	ISO KI. F / dTmax=105K, according to CEI -EN 60034-1 (2000)
Winding	ISO KI. H – according to CEI 2-3 (2000)
Nominal voltage	400 V
No. of poles	8
Thermal protection	PT 1000
Cooling	CS = self cooled version – IC 410 motor without servo-ventilation CF = forced ventilation – IC 416 servo-ventilated motor, according to CEI EN 60034-6-(1997) 1 ph. 230V AC - connection on clipboard in the terminal box LC = liquid cooled
Bearings	lubricated for life
Operating position	any
Colour	black RAL 9005

**MOTOR OPTIONS**

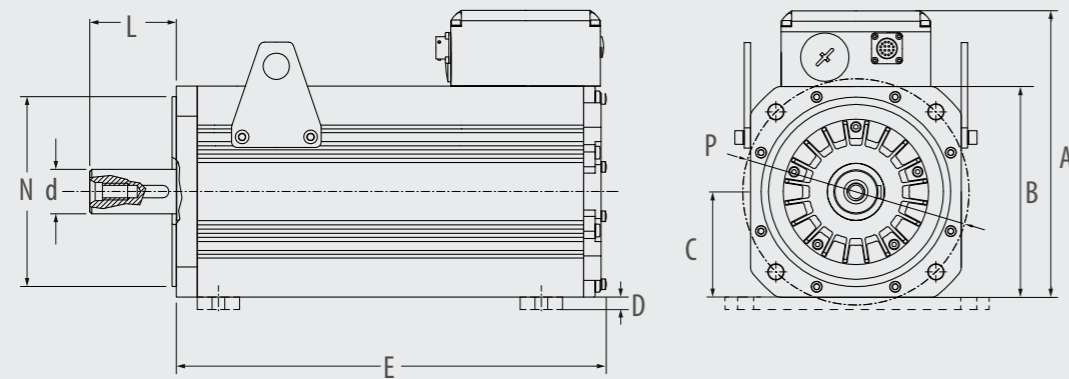
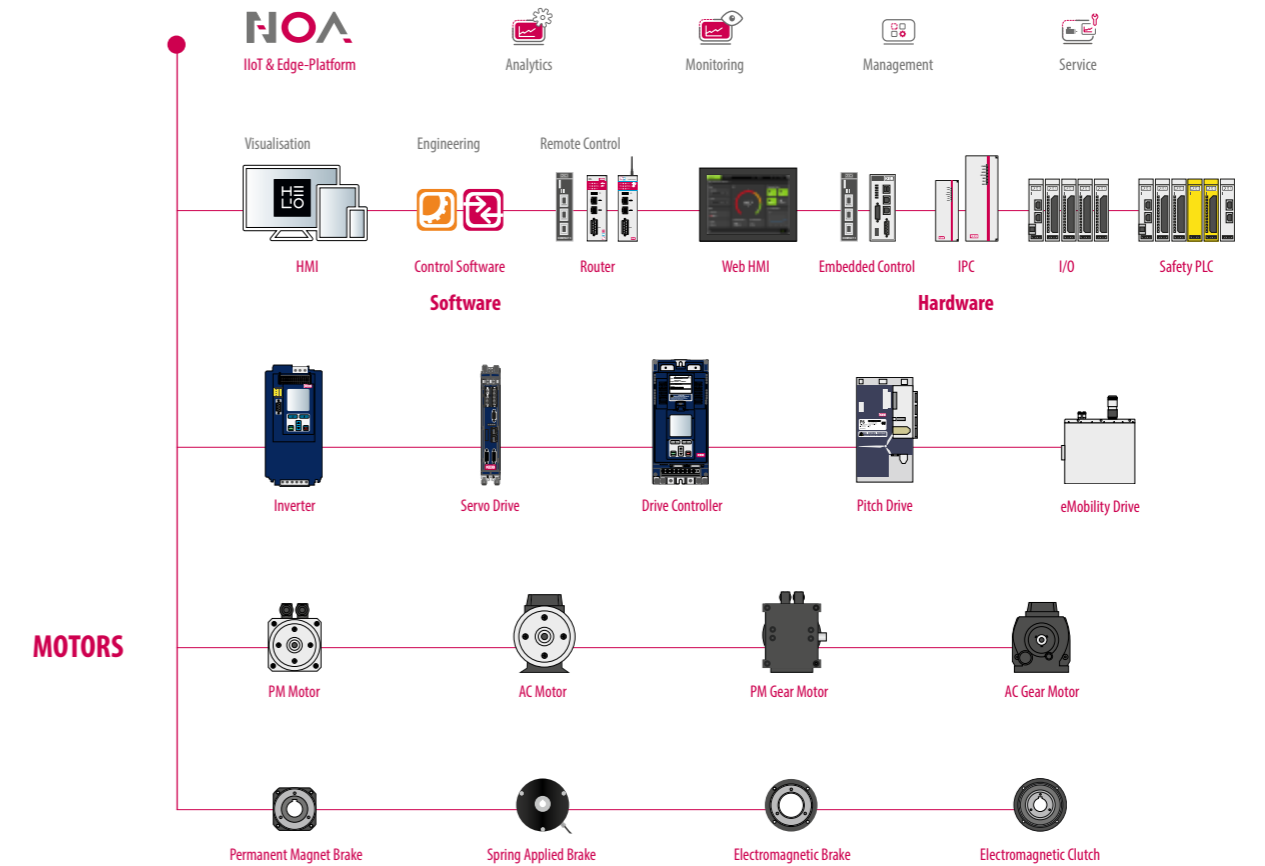
Foot/ Flange mounted version IM B3 / IM B35
IP 65 – without ventilation (with shaft seal ring D-side)
without keyway Grade of balancing: G 2.5 in accordance with ISO 1940-1 (1993)
Safety Resolver Hiperface SRS50 - 16 bit - safety Hiperface SRM50 - 16 bit /Multiturn - 12 bit- safety
Holding brake 24V DC Permanent magnet (SE, SF) Spring applied (SG)
Additional inertia

**ACCESSORIES**

Encoder cables Resolver 00S6L50 - 10xx (xx = 1 ... 50 m) Hiperface 00S6L55 - 10xx (xx = 1 ... 50 m) Connection: Speedtec plug M23
Motor cable 2.5mm <sup>2</sup> 00S4619 - 00xx (xx = 1 ... 50 m) Connection: Speedtec plug M23 (for SE/ ... /CS) Terminal box (from SE/.../CF)
Motor cable 4mm <sup>2</sup> (on request)

**SYSTEM SOLUTIONS - EVERYTHING FROM A SINGLE SOURCE**

The DL4 servo motors extend the extensive product portfolio of KEB Automation. Your advantage: From HMI and controls to frequency converters and motors to brakes, you will find ideally coordinated components at KEB. Realize your individual requirements with an attractive price-performance ratio, central contacts and optimized drive performance.



**PART NUMBER SERVO MOTORS**

**11 DIGIT CODE DL4**

F	4	D 4	2	2	B	2	3	0 0
Size	Lengths	Type	Speed Voltage	Cooling Protection	Shaft Brake	Connection	Encoder	Option

**Configuration Code**

Specific versions and samples of motors are described with a configuration.

Part number is 00SM00-CMAT -followed by an EXECUTION-CODE for DL4. f.e: SE - L2 CS SP15 FKN BRN ENC01 OP00

X X	X X	X	X	X	X	X	X X
Size/Lengths	Type	Speed/ Voltage	Cooling	Brake	Connection	Encoder	Options

TECHNICAL DATA DL 4

AIR COOLED VERSION

SIZE	LENGTH	COOLING	MOTOR									BRAKE			DIMENSIONS										
			T <sub>do</sub> [Nm]	T <sub>N</sub> [Nm]	P <sub>N</sub> [kW]	T <sub>max</sub> [Nm]	I <sub>do</sub> [A]	I <sub>N</sub> [A]	I <sub>max</sub> [A]	n <sub>N</sub> [min <sup>-1</sup> ]	J <sub>L</sub> [kgcm <sup>2</sup> ]	J <sub>Z</sub> [kgcm <sup>2</sup> ]	m [kg]	T <sub>NBr</sub> [Nm]	J <sub>br</sub> [kgcm <sup>2</sup> ]	m <sub>Br</sub> [kg]	A [mm]	B [mm]	C [mm]	D [mm]	E <sub>without brake</sub> [mm]	E <sub>with brake</sub> [mm]	ø d [mm]	L [mm]	ø N [mm]
SE	L2	CS	12	10.2/10/9.8	1.6/2.1/3.1	23.8/23.5/23.3	3.7/4.9/7.2	3.4/4.4/6.2	8.6/11/16	1500/2000/3000	8.52	14**	32	5.9	2.7(CS) 3.2(CF)	142/158*	80	9	245	295	24 <sub>j6</sub>	50	130 <sub>j6</sub>	165	
		CF	15.4	14.6/14/12.6	2.3/2.9/4	28.5/28.2/28	5/6.5/9.4	4.9/6.1/8	10.3/13.2/19.2										340	390					
	L4	CS	22	20.5/20/w16.5	3.2/4.2/5.2	44.3/45.9/45.9	6.6/9/13.4	6.4/8.5/10.3	14.9/21.1/30.9		15.1								194	300					350
		CF	31	29/28/24	4.6/5.9/7.5	53.2/55/55	9.3/12.7/18.6	9/11.9/15	17.9/25.3/37.1		19.1								224	395					445
	L6	CS	30	27.5/25.6/20	4.3/5.4/6.3	68.2/69.6/68.8	9.2/12.4/18.2	8.8/11/12.5	23.6/32.4/46.4		21.7								194	355					405
		CF	42	39/37.5/33	6.1/7.9/10.4	81.9/83.5/82.6	12.9/17.4/25.3	12.5/16.1/20.6	28.3/38.8/55.7		21.3								224	450					500
	L8	CS	39	33.5/30.4/22.2	5.3/6.4/7	91.7	12/15.9/23.5	10.8/12.9/13.9	32/42.2/61.8		28.27								26	410					460
		CF	54	49/47/39	7.7/9.8/12.3	100.1	16.8/22.1/32.5	15.8/20/24.3	38.4/50.6/74.2										24.3	224					505
SF	L2	CS	33	31.5/30.5/29.5	3.3/6.4/9.3	82.3/82/82.2	6.7/14.8/20.2	6.7/14.3/18.8	18.4/40.4/55.1	1000/2000/3000	49	50**	130	60	11(CS) 13(CF)	200/224*	112	12/20*	259	379	42 <sub>k6</sub>	82	180 <sub>j6</sub>	215	
		CF	45	42.7/42/43	4.5/8.8/13.5	93.5/93.1/93.4	9.3/20.5/27.9	9.1/19.7/27.4	21.9/48.1/65.6										37	296					353
	L4	CS	60	56/51/44	5.9/10.7/13.8	154.3/154/154.6	13.6/25.6/40.9	13.1/22.4/30.9	37.9/71/114		89								43	428					548
		CF	89	87/85/80	9.1/17.8/25.1	203.4/203.6/204.5	20.2/37.9/60.7	20.4/37.3/56.1	52.4/98.3/157		49								296	408					528
	L6	CS	82	72/62/53	7.5/13/16.7	223.6/223.1/223.3	17/37.3/46.6	15.3/29/31	49.9/110/137		128								54	502					622
		CF	130	124/118/111	13/24.7/34.9	280.1/280/280.4	26.9/59.1/73.9	26.4/55.2/64.9	65.6/144/180		64								296	577					697
	L8	CS	102	90/76.3/65	9.4/16/20.4	271.5/270.7/271.1	21.7/43.5/58	19.7/33.5/38	62.4/125/166		167								68	483					703
		CF	163	154/144/137	16.1/30.2/43	373.5/373.5/373.8	34.7/69.5/92.7	33.8/63.2/80.1	90.2/180/241										78	296					577
SG	L2	CS(*)	100(153)	93/76/60	9.7/15.9/18.8	147.4	21.6/40.5/54	21.6/33.1/34.8	38.3/71.9/95.8	1000/2000/2800	224	39(CS) 43(CF)	149	350	264/292*	132/146*	18/14*	340	475	48 <sub>k6</sub>	110	250 <sub>j6</sub>	300		
		CF	145	143/125/117	15/26.2/34.3	267.1	31.3/58.7/78.3	33.2/54.4/67.9	69.5/130.3/173.7									89	389					470	605
	L4	CS(*)	182(270)	150/113/45	15.7/23.7/14.1	258.8	36.8/73.7/98.2	32.7/49.2/26.1	63.1/126.2/168.3		401							109	447					582	
		CF	310	290/260/230	30.4/54.5/67.4	543.9/558.6/526.3	62.8/127.3/161.9	63.1/110.2/133.5	132.6/265.2/342.2									126	389					577	712
	L6	CS(*)	270(400)	205/115/0	21.5/24.1/0	386/386/378.4	58.3/97.2/143	47.6/44.5/0	100.4/167.3/251		577							143	554					689	
		CF	440	395/350/300	41.4/73.3/88	736.8/736.8/657.9	95/158.3/237.5	91.7/135.5/174.2	191.6/319.4/427.8									164	389					684	819
	L8	CS(*)	340(493)	270/130/0	28.3/27.2/0	464.9/464.9/455.8	68.8/137.7/183.5	58.8/56.6/0	113.4/226.7/302.3		753							177	661					796	
		CF	580	530/470/320	55.5/98.4/93.8	964.9/833.3/771.9	117.4/239.3/313.1	115.4/204.7/185.8	235.3/406.4/501.9									203	389					791	926

(\*) Data for S3-operation 40%- 1min. CS = self cooled CF = forced ventilation

\*\* Option: Additional Inertia

\* Motor version CF

SW: special shaft

LIQUID COOLED VERSION

SIZE	LENGTH	COOLING	MOTOR									BRAKE			DIMENSIONS											
			T <sub>do</sub> [Nm]	T <sub>N</sub> [Nm]	P <sub>N</sub> [KW]	T <sub>max</sub> [Nm]	I <sub>do</sub> [A]	I <sub>N</sub> [A]	I <sub>max</sub> [A]	n <sub>N</sub> [min <sup>-1</sup> ]	J <sub>L</sub> [kgcm <sup>2</sup> ]	Q [L/min]	m [kg]	T <sub>NBr</sub> [Nm]	J <sub>br</sub> [kgcm <sup>2</sup> ]	m <sub>Br</sub> [kg]	A [mm]	B [mm]	C [mm]	D [mm]	E <sub>without brake</sub> [mm]	E <sub>with brake</sub> [mm]	ø d [mm]	L [mm]	ø N [mm]	ø P [mm]
SG	L2	LC	185	167	17.4	290	47	48	85	1000	224	6	83	350	149	39(CS) 43(CF)	365	270	132	18	413	548	48 <sub>k6</sub>	110	250 <sub>j6</sub>	300
				157	29.6		82	79	149												1800					
				145	39.5		132	116	227												2600					
	L4	385	350	36.7	590	97	90	168	1000	401	8	115	700	205	40(CS) 44(CF)	264/292*	132/146*	18/14*	520	655	55 <sub>k6</sub>					
			330	62.2		170	149	288											1800							
			310	84.4		227	187	355											2600							
	L6	555	510	53.4	810	126	118	196	1000	577	10	147	700	205	40(CS) 44(CF)	264/292*	132/146*	18/14*	606	741						
			480	90.5		209	185	327											1800							
			445	121.2		314	257	505											2600							
	L8	770	720	75.4	1100	188	181	287	1000	753	12	180	700	205	40(CS) 44(CF)	264/292*	132/146*	18/14*	661	796						
			735	685		129.1	314	301											501	1800	709	844				

**KEB**

MANUFACTURED BY



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